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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/509,290

Applicant(s)

BADYAL ET AL.

Examiner

MARIANNE L. PADGETT

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 February 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/CD)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

1. A **Request for Continued Examination** under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/18/2010 has been entered.

Applicants' amendment to [0096] in the substitute specification, corrects the problem noted therein.

Applicants have amended their claims such that there are now three independent claims 1, 2 & 13, with it noted that amended independent claim 1 is so ...extraordinarily broad that as written virtually any patent properly classified in 427/491 or any pretreatment properly classified in 427/536-538, where the organic substrate is any sort of polymeric or resinous substrate, will read on this claim, since any polymer or resin has had material within it crosslinked at some time in its past, and any process properly classified in these subclasses will teach either a plasma deposition or some sort of plasma treatment performed on the substrate, which is all that is necessary to read on amended claim 1! Note that the "wherein..." statement is irrelevant, as it is optional, thus provides no necessary limitations. With respect to now independent claim 13, note, for example, that a denser fluid that is immiscible with a lighter fluid (i.e. a crosslinkable resin & water or aqueous solution) is capable of forming a layer structure, thus under some conditions such a resinous material is capable of supporting a coating of water or aqueous material; or a single [polymer, oligomer, monomer] molecule is an "article" to which another atom or molecule may be attached, so it fits the claims' description of a claimed substrate. Also note any resinous material in any shape is an article or substrate as defined by this claim, if any sort of material can be retained on a surface under some conditions, with it noted that other than this "definition" of a substrate, claim 13 is the same as claim 1, hence equally broad, since this definition of a substrate does not appear to create any

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narrower scope. Now independent claim 2 is equivalent to claim 1, except positively requiring that the step (i) crosslinking be performed using plasma.

Note substrates containing "crosslinkable" material in clued unpolymerized precursors of polymers (any amount), since when such materials are polymerized, they connect to other molecules, thus are crosslinked.

2. **Claim 11 is objected** to under **37 CFR 1.75(c)**, as being of improper dependent form for failing to further limit the subject matter of **a previous claim**. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. While multiple dependencies are permissible, as long as they are not dependent on other multiple dependencies, they are required to be in the alternative, and claim 11 states "according to claims 9 and 10".

3. **Claims 1-23** are rejected under 35 U.S.C. **112, first** paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicants have made the generic statement at the beginning of their Remarks on page 7 of their 2/18/2010 response that the "amendments are supported by the specification. No new matter has been introduced", however they do not appear to have made any attempt to actually site the support for their amendments. Computer search of applicants' PGPub for "stable" & various related forms of this word, found the applicants' statement & amendment does not appear to be supported by their original specification. The word "stable" was found to be employed in four paragraphs, none of which in the context of the amended claims, nor is any general definition for this relative term newly employed in the claims found to be provided.

Specifically, in [0057] of the substitute specification ([0059] of the PGPub), Ar plasma pretreatment prior to plasma polymerization of dimethyl sulfate is taught at result in greater stability towards solvent removal with the teaching that "The most hydrophilic and **stable** surfaces were achieved by using a **combination** of high power levels for both **argon plasma crosslinking** and **plasma polymerization of dimethyl sulfate**" (emphasis added), hence this teaching only supports "stable" hydrophilic surfaces of plasma polymerized dimethyl sulfate formed with specific processing, but it does not define exactly what constitutes this relative term of "stable", even in this context.

In [0070], this discussion is concerning "porous non-woven polypropylene substrates, plasma penetration of both argon and dimethyl sulfate plasmas improved at higher power settings....Argon plasma pre-treatment (surface crosslinking) in combination with plasma polymerization of dimethyl sulfate at higher powers (necessary for penetration into the sub-surfaces) was found to produce the most **stable** hydrophilic surfaces", thus providing substantially the same context as [0057] & no definition or general support for the new claim limitation.

In [0089], the case of "argon plasma, pre-treatment followed by air plasma oxidation" is discussed with respect treatment of a nonporous polypropylene film ([0088]), where it is taught that "argon plasma crosslinking improve the **stability** of the oxidized surface towards solvent washing (hydrophobic recovery). Control experiments comprising just argon plasma exposure were found **not** to be effective...; however these oxidized surfaces were also **stable** towards hydrophobic recovery. The extent of argon plasma crosslinking (i.e. argon plasma power level) was found to govern the **stability** towards hydrophobic recovery following air plasma exposure". While the examiner is uncertain *exactly* what is meant by "hydrophobic recovery", but it appears to be related to hydrophilicity & it is certainly much more specific than the claims' generic "stable conditioning effect", which is all-encompassing, with no limits with respect to exactly what is stable & what environments the unknown whatever is stable under.

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[0100] discusses "The **two-step sequence of plasma treatments** gives rise to **stable-wettable** polymer surfaces. This entails **crosslinking** the surface first, **followed by** the deposition of **hydrophilic** species. The contact angle, XPS and FTIR measurements all indicate that these surfaces are **stable** towards hydrophobic recovery....modified by this method to yield high capacities for water absorption", thus again relate to the requirement of two plasma treatments with specific effects relating to hydrophilicity & "hydrophobic recovery", not a generic undefined "stable conditioning effect".

While it appears that the computer word search missed some relevant teachings due to the **lack** of American English spelling for words such as "stabilizes" or "stabilized", review of paragraphs such as [0098-99] & [0101], all provide discussions that are consistent with the above detailed paragraphs, and fail to provide support for applicants' amendments in the **broad scope claimed**, which creates some unspecified condition, that under unspecified environments is "stable" in an undefined way in a substrate, the substrate limited only in that at least some portion of material therein, no matter how little, is any material in the universe that can be cross-linked, and is cross-linked at some time before coming into contact with a (or more) plasma that creates some unspecified modification or deposition, **thus** as presently written the amended claims encompass **New Matter**, as the claimed scope appears to be considerably broader than the teachings of the original disclosure.

4. **Claims 1-23** are rejected under 35 U.S.C. **112, second** paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Use of **relative terms**, that lack clear metes and bounds, in the claims, or in a definition provided in the specification, or in relevant cited prior art, is vague and indefinite. Applicants have amended all their independent **claims 1, 2 & 13** to use the relative term "**stable**" when requiring "applying a **stable** conditioning effect to a crosslinkable material substrate" (emphasis added), where the claims do not define **what** about the conditioning effect is stable, under **what conditions** it is stable, etc., thus these

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claims as amended fail to have clear metes and bounds, which may be used to determine what results are covered or intended to be covered by the amended claims. For purposes of examination, almost any results of crosslinking (at any time of an article or substrate's existence) + plasma treatment (decomposition, molecular rearrangement, addition of functional groups, deposition (atoms or layers), etc.) can be considered "stable" under some conditions, thus this adjective is **NOT** considered to have any determinable limiting effect on the scope of the claims.

In **claim 1**, line 3, "the treatment steps" lacks proper antecedent basis, since no previous "treatment steps" were introduced. Note this may be easily corrected by deleting "the". However it is further noted that in the last two lines "step (i)", fails to use an article showing antecedent basis, although the "step" nomenclature was previously introduced, such that this new introduction makes it unclear whether "(i) crosslinking..." is the step being referred to. In this case, inserting "the" will correct the problem. **Also note**, that in line 2, "material" is used as an adjective, not a noun, thus in **line 5** "the material" lacks proper antecedent basis, as does "the exterior surface", unless of course applicants are requiring the **entire** exterior of any shape surface, i.e. all of top, bottom, sides, etc., to be so treated, and not just for example an upper surface. The intended meaning may be considered ambiguous. In **line 6**, "both surfaces" fails to use proper antecedent language & it is unclear exactly what surfaces are necessarily being referred to, i.e. top and bottom surfaces, all external surfaces & all surfaces of any porous substrate, some but not all of internal & external, etc. Note analogous problems with like phrasings employed in **claims 2 & 13**.

In each of independent **claims 1, 2 & 3**, there are two separate introductions of "plasma modification", where the second introduction of the term neither shows antecedent basis to the first introduction, nor clear differentiation therefrom, hence it is **uncertain** whether these otherwise identical limitations are intended to be the same plasma modification, or if they can be different plasma modifications. For purposes of examination, either possible option will be considered.

In **claim 3**, line 2, note that "steps (i) or (ii)" also lack in article showing proper antecedent basis.

In **claim 4**, "the first step (i)" & "the second step (ii)" (emphasis added) lacks proper antecedent basis, as it is inconsistent with all previously introduced "step (i)", as none have previously been described as "first". Would applicants perhaps intend -- wherein the material substrate is first modified in the step (i) to form a hydrophilic layer, and second the plasma modification or the plasma deposition of the step (ii) is acting to oxidized or nitrogenate the hydrophilic layer --? If not, the examiner is not sure what is meant, making the claimed meaning uncertain. **Also**, even considering the examiner's guess at applicants' intent, how does this "hydrophilic layer" relate to the cross-linkable substrate material, which step (i) is supposed to be crosslinking? There is no clear connection, thus this could simply be another operation in conjunction with the crosslinking limitation, or it could be the result of the crosslinking, so this claim language remains ambiguous due to unclear associations of new terms with previous limitations of the step (i). Note that the suggested language would require modifying the phrasing of claim 5, by deletion of "second".

Claim 14 has been amended such that it now reads "wherein the substrate is a porous article, a bulk matrix and pours extending from the exterior surface..." such the phrasing is ambiguous, i.e. is this claim now describing two options or is one now need further described by the other? Assuming the latter, would phrasing such as -- wherein the substrate is a porous article, having a bulk matrix and pours extending... -- provide applicants' intended meaning?

Analogously, **claims 9, 10, 11, 12, 17 & 18** have inconsistent nomenclature with respect to the "step" language employed in the preceding claims, where note in **claims 17 & 18** "said step" unclearly may refer to any of the possible different introduced steps in preceding claims. Also note that in **claims 7, 19, 20 & 21**, references to "step..." or "steps..." lack an article showing antecedent basis (e.g. -- the --).

Claims 20, 21 & 22 all still employ the relative term "superabsorbent", which lacks clear metes and bounds in the claims, which do not define what range of absorbcency is encompassed by

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"superabsorbent". Claims 20 & 21 have been amended so as the claims relate how the results is rendered "superabsorbent", but this still does not indicate how absorbent something is in order to be "super-absorbent", and claim 22 is unchanged. It was previously noted that while [0004] in the specification states that "These water absorbing resins are often termed 'super absorbent polymers' or SAPS, and typically comprise crosslink hydrophilic polymers", this is **not a definition**, and is only exemplary in nature, a with reference to exemplary compounds, and cannot be considered to provide a definite scope could use of this term in the claims. Claim 22 has an additional different problem, in that it is unclear **when** "the substrate is a superabsorbent material", since as claimed this could be before, during, or after any of the processing steps (i.e. it could start out super absorbent, or it could end up super absorbent), thus is ambiguous in its intended meaning.

5. **35 U.S.C. 101** reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-3, 13-14 & 23 are rejected under **35 U.S.C. 101** because the claimed invention is directed to non-statutory subject matter. Applicants have amended their claims in such a fashion that they are so broad as to read on **naturally occurring phenomena**.

On considering the scope of applicants' claims as amended, the examiner was reminded of college astronomy classes where she learned that interstellar matter contains both plasmas & polymers. As indicated by the **Kaplan** reference "PLASMA, The Chemistry Tool for the 21st Century", naturally occurring plasmas include those in interstellar nebula, intercellular space & the Earth's ionosphere (table 1, first page). As indicated by discussion in **Vanysek et al.** "From aldehyde Polymers in Comets" (abstract; 2nd & last ¶ Introduction; section 2, 1st ¶ & table 1 p. L21, particularly entries with note #7; page L22-L23; etc., esp. conclusions on p. L26, with discussions of polymers in, cometary meteoroids), complex organic molecules, inclusive of polymerizable materials & polymers (i.e. crosslinkable & crosslinked) are present in interstellar matter, including polymers with multiple heteroatoms (O &/or N),

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with indications that they also present in cometary dust, with polymers common in carbonaceous chondrites typical of cometary meteoroids, where the examiner notes that such cometary meteoroids will have passed through the Earth's ionosphere, thus a plasma, when arriving on earth, thus creating plasma modified polymeric material where that polymeric material would reasonably have been expected to encompass at least some crosslinked content, which is all that is required by the president claim limitations. In other words, given the scope of applicants' claims either the cometary material containing polymers or polymer precursors, or the polymers or polymer precursors themselves may be considered substrates, and reaction of these polymers or polymer precursors to polymerize read on claimed crosslinking, where any subsequent (or continued) contact of such polymerized material in interstellar space or the Earth's ionosphere with any of the forms of plasmas, where that contact includes any reaction (i.e. either further polymerization or decomposition or any alteration) reads on applicants' claimed step (ii) plasma treatment. Therefore, applicants' claims, **as presently written**, are of such extraordinarily broad scope that they read on such naturally occurring phenomena, thus for this extraordinarily broad scope may be considered to fall under **nonstatutory matter**.

Note that the interstellar matter interacting as discussed by Vanysek et al., includes oxygen containing gaseous compounds, and that cometary matter may be considered porous. While the examiner sincerely doubts the applicants had any intent to read on polymer & plasma processes that take place in interstellar space &/or the Earth's ionosphere, their broad claims with undefined relative term "stable" applied to essentially any polymerizable & polymer material in the universe, treated by unlimited types & effects of plasma, have made such rejection necessary, but hopefully will further applicants' understanding of the problems with the current scope.

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
- (c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of **35 U.S.C. 103(a)** which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The **nonstatutory double patenting** rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

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Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. **Claims 1-2, 7, 13-19 & 23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-21 of copending Application No. 10/509,295.**

Although the conflicting claims are not identical, they are not patentably distinct from each other because these two sets of application claims are still directed to overlapping sequences of steps, which may be considered to encompass obvious variations of each other. The **copending claims (295) have been amended to now require successive steps** of applying polymeric material to a substrate surface, then fluorinating, then curing at least part of the coating. However, these successive steps still have a multiplicity of possible means of performing them. Specifically, copending (295) includes the options of **depositing polymer** coatings by any of 7 methods (copending claim 2), including **plasma depositing** their claimed applied polymer coating, **where combinations of any of the methods** can be employed, hence encompasses multiple coatings (e.g. any of the liquid deposition techniques + plasma deposition would be to depositions) or a liquid deposition technique that applies the polymeric material, which is treated by plasma to create the overall deposition, i.e. forms a crosslinkable material composite substrate, applies plasma thereto to crosslink it.

The copending (295) claims' fluorinating limitation maybe via exposure to remote plasma (depending claims 13-14) & also may cause crosslinking (claim 15), thus they read on either of applicants' steps (i) or (ii), thus still include chemistry consistent with present claims 7. As presently invented the copending case's independent claims 1 & 18 both require both fluorination and curing, as do their depending claims. Note, the various possible techniques of **curing** (claim 16: heating, the UV radiation, UV, EB &/or ionizing radiation) are noted by the examiner to encompass features of a **plasma**, and where they claimed alternative step options include depositing a polymer coating (may be considered

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part of a composite substrate), curing the coating, then fluorinating. The also option of disposing the coated substrate in the plasma after coating is a possibility (i.e. plasma curing), as is the curing of the fluorinated surface affecting the crosslinking of the underlying substrate, thus are still overlapping with possible options of the present claims, as crosslinking of a composite substrate comprising crosslinkable material may occur in either or both applying &/or fluorinating limitations of the copending (295), where either may include plasma, and where the subsequent curing limitation may also employ means that encompass the effects of plasmas, hence these sets of claims are still lacking clear distinction.

It is further noted that as **[0020] of the present specification** states the "porous matrix can have a void volume ranging from 0.01% to 99%...", it must be considered that read in light of the specification the present claimed porous substrates include void volumes as low as 0.01%, with even lower void volumes necessarily encompassed by the broadest claim 14 that does not limit the void volume (i.e. in which case the claimed "pores" extending from the surface must be truly microscopic & may read on expected interstitial spaces between molecules), it is considered that any substrate that has not been rigorously densified to be close to theoretical density will read on applicants' "porous article", if it contains any polymeric material, which copending (295)'s substrate + initial polymer coating (before curing & fluorinating) does. While the copending claims do not particularly specify "polyolefin, they do particularly specify unsaturated polymers of which polyolefins constitute a common, conventional and major class thereof, such that the use of polyolefins in the (295)'s process would have been obvious & reasonably expected by one ordinary skill in the art. With respect to the present claims 17-19, which discuss control with respect to limiting depth of process affects or localized areas, the copending claims include options of employing masking, which will inherently localize treatment areas, and any control of parameters employed in curing & fluorinating procedures will inherently have effects on the depth affected, and it is standard & conventional for one of ordinary skill in the art to determine & control

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process parameters to optimize affects desired, thus such optimization would have been reasonably expected.

Applicant's 2/18/2010 arguments incorrectly compare only to scope of independent claim 1's of the 2 applications, essentially completely ignoring what these limitations encompass by the scope of each claims limitations, including those in their dependent claims or broadly with respect to the present claimed limitations. This analysis of applicants is completely unconvincing.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

8. **Claim 23** is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1+12-13 & 20-26 of U.S. Patent No. **6,551,950 B1** (Badyal et al.).

Although the conflicting claims are not identical, they are not patentably distinct from each other because with respect to the **product-by-process claim**, whether any initial crosslinking occurs within a single material substrate or a composite substrate (i.e. coated substrate) is irrelevant, since the structure of the substrate is almost unlimited (before processing some unspecified amount & portion need capable of crosslinking, but we not even be present or relevant to the final structure of the product), however if capable of crosslinking or polymeric already, whether any polymerization or crosslinking occurred does not produce a distinguishable substrate, or product structure, as the substrate may contain any amount of crosslinking regardless of when that occurred and read on the claimed structure, which is minimal, as the process claims from which the product derives its structure has no necessary end results that require any specific structure. In fact, the claimed structure need not even have a coating, and may simply be any substrate, particularly any polymer containing substrate, as a polymer containing substrate has linkages between monomeric or oligomeric units, but the presently claimed product need not even be limited to this! in the **(950) patent**, the claimed class of substrates as fabric or clothing, would reasonably encompass polymeric fabric substrates whether natural or synthetic, however the plasma polymerized

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coating thereon is clearly a polymer that may be considered to encompass crosslinked structures, hence as applicants' claims encompass such composite substrate materials (among other things), whether or not the plasma deposition option in the process is employed, the resultant structure may be considered to read on the product claim. Furthermore, it is noted that on **col. 1, lines 22-35 in the background of (950)** the patent indicates that for coatings on fabrics as claimed to be durable they must be cross-linked. i.e. bonded, to the fabric substrate, thus read in light of the specification, it would've been obvious to one of ordinary skill in the art for the claimed plasma polymerized coatings to have a structure that is bonded via crosslinking to the substrate, as the disclosure recognizes this is a necessity for durability & one of ordinary skill in the art when making taught water repellent coated fabric substrates would have reasonably have been expected to have optimized their coating procedure for durability.

Applicant's 2/18/2010 arguments with respect to PN 6,551,950 are based on the limitations of process claim 1 that is not in this rejection, which limitations are virtually meaningless with respect to the product, because limitations independent claim 1 provide virtually no necessary structure, since even though one must start with a substrate that must have at least a smidgen of crosslinkable material, which must be cross-linked a subsequent plasma treatment, that last plasma treatment is required to produce no particular or definable final effect, thus no necessary structure is required in the product which encompasses any possible effect that any possible plasma could have on any possible substrate that has cross-linked material in it! Note the final plasma treatment could totally destroy every bit of a polymer or polymeric material in the initial substrate, and it would still read on applicants claimed the product (as well as process). Applicant's arguments show a complete lack of any understanding of the scope encompassed by their product by process claim, as well as by their own claimed language for the process.

9. **Claims 1-3 & 7-19** are rejected on the ground of nonstatutory **obviousness-type double patenting** as being unpatentable over claims 1-19 & 24 of U.S. Patent No. **6,551,950 B1** (Badyal et al.), in view of Seki et al. (JP 03-14677).

The Badyal et al. (950) patent's claims overlap with options of the current claims by plasma depositing a polymer layer to form oil &/or water repellent coatings on a substrate inclusive of polymeric materials, fabric, etc., which polymer layer may be formed from a fluoride containing gas &/or an unsaturated monomer having a sulphanamide group (i.e. the gaseous monomer may be nitrogenous), using a pulsed plasma techniques, which may employ a high-frequency voltage, thus encompasses either RF frequency or microwaves, and being pulsed can be considered non-equilibrium as it is in a constant state of change or fluctuation. Average power density is employed claim use of $<10\text{ W}$ or $<1\text{ W}$ in a 470 cm^3 volume (implies chamber space). The patent claims differ from the current claims in that they do not require two plasma treatment steps (unless one considers each plasma pulse to be a plasma deposition of crosslinked material step), with the first plasma causing crosslinking, or an initial step causing crosslinking by any means possible, followed by plasma treatment inclusive of the plasma deposition of the (950) claims. Plus, the (950) claims do not specifically mention the crosslinking occurring in the substrate material, however as discussed above in section 8, read in light of the (950) specification such crosslinking would reasonably have been expected to occur &/or would have been obvious to optimize in order to produce known desirable durable coating structures on claimed polymer &/or fabric substrates. Also (950) does not specifically require a sequence of treatment steps that employs both a step (i) that may or may not be plasma, but specifies crosslinking & a step (ii) that requires some sort of plasma treatment, however as seen in Seki et al., as discussed in the English abstract, disclose a sequence of plasma steps treating a polyester-based fiber substrate material with a low temperature gas plasma, where the gas may be fluorine containing C_2F_4 or C_2F_6 (i.e. a fluoride), or ethylene or a silane gas, in order to deposit a polymer film on the fibrous material. Thereafter, the polymer film is treated with a non-polymerizable gas (e.g. Ar, He, etc.) to crosslink the plasma deposited film.

The plasma polymerized deposition of unsaturated monomers, optionally fluorinated, to create oil &/or water repellent coatings, such as fluorinated polymeric layers onto polymeric fiber substrates (i.e.

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fabrics as is claimed by in (950), are analogous to plasma polymerized polymer films deposited on fiber of Seki et al., thus providing **the reasonable expectation that the Badyal et al. (950)'s claims pulsed plasma deposited polymer coating may be advantageously further plasma treated using gases**, such as Ar or He, to enhance crosslinking of the polymer deposit in order to enhance bleed resistant of the dyed fiber/fabric material, which would be consistent with the desire of the (950) patented claims to form water repellent coatings surface & possible coating of fabrics, hence such further treatment of the pulsed plasma deposited halogenated/fluorinated polymer layers would've been obvious to one of ordinary skill in the art in order to insure adequate adhesion/crosslinking/bleed resistance or the like of such coating materials on fibrous polymer substrates, where routine optimization for particular polymeric materials & plasma conditions would have been expected to optimize such process.

Also note that the fabric substrates of either of these references would be considered poor substrates, without even considering applicants' extraordinarily broad range of what they call "porous".

Applicant's 2/18/2010 arguments that differences were not pointed out are not understood, since discussions of differences & obviousness thereof were previously & remained found throughout the rejections.

10. **Claims 1-3, 7-19 & 23** are rejected under 35 U.S.C. **103(a)** as being obvious over **Badyal et al. (6,551,950 B1 ≡ WO 98/58117)**, in view of **Seki et al. (JP)**, or vice versa.

With respect to the applied reference **6,551,950 B1** has a common inventor (Jas Badyal) with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(c). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR

1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

See discussions above in **sections 8-9**. Also note that the equivalent PCT reference has equivalent teachings to Badyal et al. (950), and that in the body of the specification of Badyal et al. (950), see (or ≡ paragraphs in (WO)) the abstract; figures 1-4; col. 1, lines 1-60, especially 22-35; col. 2, line 65-col. 3, line 10 (non-equilibrium plasma) & lines 11-67 for suitable monomeric organic compounds to be employed in the plasma; col. 4, lines 6-18, which discusses substrates such as particular fabrics possibly previously treated, thus consistent with dyed; col. 4, lines 19-61 for plasma deposition parameters and techniques, per strictly specifying routine determination of parameters depending on substrates and nature of polymer been deposited (lines 20-24) & the pulsed plasma polymerization technique providing well adhered coatings with greater levels of structural retention (lines 49-56), which the examiner considers to suggest the taught no need for durable bonds with the substrate, i.e. crosslinking with a polymer substrate; col. 4, lines 65-col. 5, line 3 specifically suggesting the previously described pulsed plasma polymerization techniques to cause will adhere at coatings be applied to fabric substrates; col. 6, lines 1-19 demonstrating that the plasma polymerization process is not just causing absorption of monomers on the substrate, which the examiner considers to suggest bonding to the substrate, which for taught polymer substrates would reasonably have been considered cross-linking to the substrate. It is further noted that Exs. 2 & 4 are directed to cotton fabric substrates (i.e. cellulosic or natural polymer substrates) where col. 8, lines 65-68 note the coatings have good durability (e.g. suggesting cross-link thereto); and where Ex. 5 (col. 9, lines 1-35) is to a silicone coated acrylic/nylon fabric, which is pulsed plasma treated with a fluorinated acrylate monomer & the fabric subjected to

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durability tests & comparison to a like piece of fabric with the monomer is grafted thereto (air plasma followed by vapor deposition, noting that grafting is a crosslinking connection with the substrate), where the polymerized plasma fabric shows enhanced water repellency & durability in comparison to the graph polymerized sample.

For reasons as discussed above, it would've been obvious too one of ordinary skill in the art to perform the Seki et al. non-polymer gas plasma post-treatment on the plasma polymerized initial coating in order to perform further crosslinking to improve sealing characteristics (e.g. bleed resistance, etc.) of the initially applied plasma polymer.

Alternatively, while Seki et al. does not indicate that crosslinking to the polyester fiber substrate occurred during the initial plasma polymerization deposition process, Badyal et al. ((950) or (WO) on col. 1 or the paragraph bridging pages 1-2, respectively) in their background indicates that durable polymeric coatings on fibers require bonding (e.g. crosslinking) to the fiber substrate, hence as Seki et al. is interested in the durability of their dye treated fiber (e.g. bleed resistance), it would've been obvious to one of ordinary skill in the art to optimize Seki et al. is generic low-temperature plasma to employ plasma parameters, such as useful ones suggested by Seki et al. for pulsed plasma polymerization techniques as a starting point for suggested routine experimentation, to provide optimization of the initial plasma polymerization step to ensure crosslinking with the polyester fiber substrate, in order to ensure suitable durability to the resultant product.

11. **Claims 1-3, 7-16 & 22-23** are rejected under 35 U.S.C. **102(b)** as being anticipated by or in the alternative, under 35 U.S.C. **103(a)** as obvious over **Badyal et al.** (6,358,569 B1), noting Hawley's Condensed Chemical Dictionary, as a teaching reference.

Claims 4-6 or optionally 1-19 & 22 are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Badyal et al.** (6,358,569 B1), alone or in view of **Badyal et al.** (6,551,950 B1 \equiv **WO 98/58117**), noting Hawley's Condensed Chemical Dictionary, as a teaching reference.

In **Badyal et al.** (569), particularly see the abstract; figure 5; **col. 1**, lines 3-68+, esp. lines 28-30 relating to treatment of a porous or microporous substrate, lines 30-36 employing pulsed electrical & pulsed gas to form an adherent layer of unsaturated carboxylic acid polymer on the substrate, then attaching perfluoro alkyl groups to the polymer surface, lines 37-44 where the pulsed gas in the plasma may be an acrylic acid polymer precursor by itself, or may be used with a pulsed process gas that may be oxygen, or noble or inert gas or N₂, etc., lines 55-56 where the plasma power is preferably 1-100 W or 1.5-7 W, lines 57-61 teaching substrate material may be carbonaceous (e.g. natural materials such as cellulose...), synthetic, ceramic or metallic or combinations thereof; **col. 2**, lines 33-58 teaching superior surface coverage with pulsed gas alone or in combination with RF pulses, with application to filtration, chromatography & medical devices, mentioning low-cost thermoplastic substrates coated, porous or microporous substrates, or polymers such as fluoropolymers like PTFE that may themselves be films (line 42), or **polyethylene** (line 44) i.e. a polyolefin & **cellulose of polyurethane foam** substrates have been absorbent natures for use in sanitary, wound dressing products, etc., when coated by the taught process sequence, to form a final product with a superhydrophobic surface layer (line 50-54); **col. 3-4**, esp. parameter descriptions for figures & **col. 3**, lines 34-45 & 60-**col. 4**, lines 7 & 47-67 teach various sets of plasma parameters & operational conditions, with **col. 4**, lines 47-67 discussing the desirable use of oxygen gas for improved retention of monomer structure (i.e. oxygen retention, thus creating hydrophilicity at this stage of the process); **col. 5**, esp. lines 1-12 & 36-41 discussing an exemplary first treatment employing pulsed gas & electric pulses for plasma polymerization in the presence of oxygen, thus increasing the oxygen content on the substrate surface as well as **depositing the initial layer & teaching to optimize the subsequent surface F derivatisation**; and **col. 6**, lines 11-17 for the option of using a further cold plasma step to fluorinate (i.e. plasma modification) the deposited plasma polymerized polymer layer using SF₆; and claims, particularly 1-2, 9-10 & 12-13. Note these teachings are **considered to read on applicants claims' option of employing a combination of step (i) ≡ the adherent plasma**

polymerization deposition is on a taught polymeric substrate, which would create crosslinking between substrate & plasma deposit layer & step (ii) \equiv techniques of plasma fluorinating of a crosslinked material, that may employ a pulsed RF plasma (i.e. non-equilibrium) & pulsed gas (i.e. plasma modification thereof using a fluoride containing gas).

While Badyal et al. (569) do not explicitly discuss crosslinking of their plasma polymerized acrylic acid polymer with taught polymeric substrates, employing the taught pulsed plasma with a polymeric substrate would inherently create active sites on the substrate to which the plasma is applied, such that the polymer monomers plasma polymerized onto the substrate during the taught plasma process would **inherently form at least some crosslink bonds to the surface** when forming the **taught adherent** layer, as to be adherent would require bonds to be formed between the deposit & suggested polymer substrate, such as the taught polyethylene or the like (i.e. bonds formed between the polymer chains of the polymer substrate & the polymer of the polymer film being formed would have been expected to include crosslinkages considering suggested substrates were already polymerized), thus reading on the claimed step (i) treatment required to cause crosslinking of substrate material, inclusive of on the surface (e.g. the exterior). Furthermore, each plasma pulse may be considered a plasma treatment & the reactions of each plasma pulse would reasonably have been expected to include crosslinking with deposited polymeric material &/or substrate, as plasmas in general cause more than a single type of chemical linkage to occur, hence would have been inherently inclusive of at least some crosslinking. Alternatively, as Badyal et al. (569) teach that the plasma polymerized layer **should be adherent** & teach usages such as in filtration, chromatographic & medical devices where separation of the deposit layer would be detrimental, it would've further been obvious to one of ordinary skill in the art to optimize their plasma polymerization process in order to maximize bonds between the plasma polymerized layer & taught polymer substrates in order to produce taught adherence &/or strengthen or increase the degree of adherence to ensure reliable operation.

Furthermore, whether one considers such crosslinking inherent &/or obvious with respect to taught adherence of the plasma polymer layer, for taught use of substrate such as polyethylene (col. 2, line 44 & col. 3, line 32), this generic polyethylene encompasses substrates that have been crosslinked (meets step (i) requirement of all independent claims), as can be seen by the discussion of polyethylene on pages 933-934 of Hawley's Condensed Chemical Dictionary, which indicates that various types of polyethylene are crosslinked, inclusive of when a substrate is of molded polyethylene at his crosslink after shaping, thus taught polyethylene film is would've included substrate material that had been crosslinked. Also the dictionary discussion of polyethylene indicates that polyethylene undergoes crosslinking with exposure to various radiation (e.g. electron or γ radiation) & chemical environments, thus as plasmas have energetic free electrons which as the plasma impinges on the substrate would bombard the substrate, thus providing evidence for the for the above asserted inherence of crosslinking occurring when plasma polymerizing on polymer substrates such as polyethylene.

Optionally, it would've been further obvious in view of teachings of **Badyal et al.** ((950) or (WO 117)) in their background concerning the importance of bonding between analogous coating & substrate material.

It is noted that the teachings of Badyal et al. (569) may use both pulsed plasma & pulsed gas on neither their first or second plasma process, thus may be considered to read on any of these dependent claim processing parameters in their various possible interpretations. Alternatively, the majority of specifically discussed process parameters in (569) are directed towards the initial plasma polymerization deposition process, where the specific example of plasma fluoridation does not provide specific power parameters, however it would've been obvious to one of ordinary skill in the art to employ routine experimentation to determine optimal parameters for achieving the taught fluorination effect, where parameters as taught for the initial plasma polymerization reaction would have been a reasonable starting

point for routine experimentation to optimize for the next stage of plasma treatment, given that the previously applied surface coating may be considered to be a feature in common.

While claims 4-6 still have confusing language with uncertain meanings, they now used step (i) or (ii) nomenclature, where the steps could still be considered applicable to effects in sequential pulses in the process of Badyal et al. (569), since these steps & the independent claims do not preclude repetition of plasma producing the same affect multiple times, thus since the use of oxygen admixed in the pulsed gas & pulsed plasma deposition process increases oxygen functionality retention, i.e. hydrophilicity, which may also be considered to be acting to oxidize in order to provide such retention, therefore the acrylic acid polymer deposited would be a hydrophilic layer. Note both oxygen gas & acrylic acid monomers are oxygen-containing chemicals. Also, Badyal et al. (569) teaches use of oxygen or noble or inert gas or nitrogen with their acrylic acid polymer precursor, but they do not specify mixing these process gases, however it would've been obvious to one of ordinary skill in the art to employ mixtures that include nitrogen or inert or noble gases, as such is a standard plasma processing practice, typically employed for optimizing pressures or proportions of individual components within a desired pressure range, especially considering that these gases are typically desirable gases for plasma stability & may generally be employed without undesirably affecting the composition of the applied coating.

The examiner notes that oxygen gas used in the plasma will inherently produce various oxygen species, inclusive of ozone, thus such an oxygen containing plasma will have at least some oxidizing occurring due to ozone.

With respect to the wide range of claimed void volumes of 0.01-99 %, it is considered that the taught porous or microporous substrates, while not been described with a particular void volume, would necessarily be encompassed by this extraordinarily broad range, and necessarily in comp is the existence of pores in the void volume structure. Alternatively, it would've been extraordinarily obvious to one of

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ordinary skill in the art would employing taught porous & microporous substrates in the taught process, to employ claimed void volumes, as it would be virtually impossible not to.

12. **Claims 1-3, 8, 13-19 & 23** are rejected under 35 U.S.C. **102(b)** as being clearly anticipated by Schultz Yamasaki et al. (6,156,394), also noting Hawley's Condensed Chemical Dictionary, as a teaching reference.

Applicant's assertion that claims 1, 2 & 13 produce hydrophilic coatings (page 14 of 2/18/2010 response) is extraordinarily puzzling, since the word **hydrophilic** is in no way associated with any claim limitations in these claims, only mentioned in claim 4, thus it's 2 dependent claims 5 & 6, which were not and are not included in this rejection. Since the crosslinkable material claimed is completely generic, nothing that one does to it can be said to create any particular effect, let alone specifically hydrophilic! It is noted that applicants also cite page 7, paragraph 3 & page 12 paragraph 2 of the application as filed as teaching "stability of the crosslinked substrate is determined thermally war by solvent washing", however no such discussion was found at such a location in either the original specification or the substitute specification, however it is noted that the certified priority document discusses thermal stability of a polymer with respect to first & second steps, on its page 7, while page 12 relates to a paragraph discussed above in new matter rejection, which is specific to very specific two-step plasma process, which has never been claimed. Therefore, neither of these citations provides a definition for the lack of clear metes and bounds in the claims, nor any necessary meaning to be actually claimed process, as they are not commensurate scope with what applicants have actually claim.

As applicants' claims have no clear scope for "stable conditioning effect", this new limitation of 2/18/2010 has no effect on the rejection. The requirement of "improving the absorbent see" has been removed from the claims, so is no longer an issue; and the material being treated has been required to be crosslinkable, but Schultz Yamasaki et al. was already teaching using "polymeric optical substrates.. (i) acrylate containing polymers such as. polymethylmethacrylate... and other acrylics or acrylate containing

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polymers **sensitive to photo or thermal crosslinking**, such as polyethyl acrylate; (ii) polycarbonate; (iii) a variety of other polymers, including polyethylene terephthalate, polyimide, polystyrene, polyester, **polyethylene**, and a variety of different epoxy containing polymers; and (iv) mixtures and derivatives thereof" (emphasis added), thus explicitly teach crosslinkable substrate materials, so the amendments to the claims can in no way be said to remove the teachings of Schultz Yamasaki et al. for reading on the claims as still written.

It was noted that whether a teaching causes cross-linking to occur to somehow change an absorbent property, or for some other purpose (e.g. increasing adhesion) is entirely irrelevant to the claims as written, since the claimed process need only cause crosslinking to occur at some location with respect to the substrate material, where that cross-linking itself need have no effect on "the absorbency" nor necessarily on the stability of unknown amounts at unknown times under unknown conditions, even if its context was defined & the final results was positively ascribed to the body of the claim steps, because it is the required results, & has not been attributed to any particular step in the overall process. It was noted, improving adhesion can be considered to increase the absorbency of the coating material on the substrate, but it is also a form of increasing stability of a final product, which is within the broad possible meanings of the amended claim language. As the process of Schultz Yamazaki et al. change the characteristics of the substrate surface, the absorbency thereof will have been changed, and since there change to surface is desired, it may be considered "improved". Especially note that col. 6, lines 35-58 discuss altering the carbon/oxygen ratio on the surface (i.e. limited), which will inherently effect the hydrophobicity/hydrophilicity of the surface, thus the probability of polar or nonpolar liquids being absorbed on the surface, and enabling their adherence, which may be considered to read on being a stable effect under various possible conditions.

To reiterate, **Schultz Yamasaki et al.** teach improving the adhesion of optical coatings (e.g. plasma CVD deposited silicon nitride, etc.) on polymeric optical substrates via the exposure to

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electromagnetic radiation having wavelengths of about 30-350 nm, which may be performed via direct exposure to gas plasmas of He, Ar or nitrogen, and **causes cross-linked bonds to form in the polymeric substrate surface**, so that there is consequently improve the adhesion at the interface with the subsequently deposited coating that may be plasma deposited (i.e. improve stability as compared to a non-previously crossed link substrate). The exemplary direct exposure plasma apparatus employs a microwave/RF dual frequency plasma system, where a negative DC substrate-bias voltage may be applied to cause ion bombardment from the plasma, where it's noted that this extraction of ions to bombard the surface may be considered a form of non-equilibrium plasma. Also, Schultz Yamasaki et al. teach that other useful direct exposure plasma apparatus may include simpler or more complex systems. Particularly see the abstract; figures 4 & 6-7; col. 1, lines 5-25; col. 2, lines 1-20+; col. 3, lines 10-26; col. 4, lines 1-20+ (substrates, inclusive of polyolefins) & 40-60; col. 5, lines 37-52; col. 6, lines 13-35 (plasma/electromagnetic wave pretreatment resulting in changes in stoichiometry, increased resistance to acetone damage & cross-linked bonds on surface); col. 7, lines 15-44; col. 8, lines 11-21 & 35-50; examples, especially noting the PECVD of silicon nitride (col. 9, lines 28-39 employed in those the examples & Ex. 2, col. 10, lines 20-54; Ex. 3, col. 12, lines 20-32; Ex. 5, col. 14, lines 65-col. 15, lines 14; Ex. 6, col. 16, lines 15-32); and claims 1-5, 11-13 & 17-24.

Note that plasma power employed by Schultz Yamasaki et al. varies dependent on particular plasma process & gas, such as in col. 16, lines 1-32 microwave plasma employing ammonia or N₂O using 150 W, or a biased RF pretreatment gas plasma of ammonia using 30 W, or an argon RF plasma employing 30 W or Ar in remote or direct microwave plasma of 150 W, with subsequent deposition of amorphous silicon nitride, which for plasma CVD thereof, as suggested in the reference via a silane ammonia mixture, would be deposition of a nitroenate material with a nitrogen containing compound. I 13.

Claims 1-2 & 7-10 are rejected under 35 U.S.C. **102(b)** as being clearly anticipated by Nguyen et al (5,244,730).

Nguyen et al teach a process of plasma polarization of a **fluorocarbon layer**, where a plasma polymerized fluorocarbon layer is deposited on the **internal surfaces** of the plasma chamber, exemplified by a 2-stage plasma process using carbon fluoride gases, then followed by **use of the plasma chamber for plasma polymerization deposition on substrates**, which causes further deposition of the **plasma polymerized material on the interior surface** of the chamber, as well as on the substrates being processed, where the deposition process is **taught to form highly cross-linked fluorocarbon films**. *In other words*, one has a substrate = chamber that has been coated with a fluorocarbon layer, where the plasma that deposits at, also treats the layer such that it is highly cross-linked. Each successive use of the chamber = substrate to perform plasma polymerized depositions, also deposits on the chamber walls, thus causing further cross-linking of the initial fluoropolymer layer, plus of each successive deposition thereon, such that each successive deposition may be considered to read on both steps (i) & (ii).

Is further taught after sufficiently long periods of use (e.g. 10 hours) when deposited thicknesses of a fluorocarbon materials have built-up on the chamber, it is **clean by oxygen plasma** that the plasma deposition coating process for internal surfaces & use is repeated, which reads on another alternative plasma modification that reads on the claimed step (ii). Particularly see the abstract; the figure; col. 3, lines 27-col. 4, lines 50+; col. 5, lines 57-67; col. 6, lines 7-25; an example 1 on col. 6. These teachings read on the first plasma polymerization stepped depositing a plasma polymerized layer which may be considered part of the substrate material for subsequent steps, with the next plasma polymerization deposition causing crosslinking therewith (i.e. step (i)), plus subsequent plasma polymerizations or oxygen plasma cleaning is being an unspecified number of step (ii) plasma modifications or plasma deposition of crosslinked material onto either in the plasma cleaned chamber surface or onto cross-linked plasma deposited material. As has been previously noted, the plasma depositions onto the plasma deposited fluorocarbon, would inherently be causing further crosslinking of the previously deposited

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polymeric material, thus it's also effectively inclusive of step (i) preformed both concurrently & in sequence with step (ii).

Note plasma treatment/deposition may be via RF plasmas, where power includes 100-1000 W (col. 4, lines 1-64), thus overlapping with claimed power ranges.

14. **Claims 1-3, 8-10 & 13** are rejected under 35 U.S.C. **102(b)** as anticipated by gr, in the alternative, under 35 U.S.C. 103(a) as obvious over **Kamel et al.** (5,326,584).

Claims 1-3 & 8-10 & 13-19 are rejected under 35 U.S.C. 103(a) as being obvious over **Kamel et al.** (5,326,584), in view of **Schultz Yamasaki et al.** (6,156,394).

The claims require first step (i) to be a crosslinking limitation, with independent claims 1, 2 & 13, requiring the second step (ii) to be any plasma process applied to the substrate with cross-linked material, where the claims have been amended to require something about the process be a "stable conditioning effect", without this term having any clear or definable meaning within the scope of the claim limitations.

As previously set forth, **Kamel et al.** (abstract; col. 6, lines 4-41; col. 7, lines 42-68; col. 8, lines 12-col. 9, lines 30+; examples, e.g. Ex. I + Ex. II; and claims 1-9) teach a process of **modifying the surface of polymeric substrates**, such as polymeric intraocular lenses of material such as PMMA, via a **sequence of plasma steps**, that include initially cleaning the polymer surface via a plasma etching or treated with **RF plasma** of gases that may be **nitrogen or ammonia** (if introduction of nitrogen is compounds is desired), or **noble gases such as argon** (for creation of active sites that do not produce new chemical groups). After cleaning/activation polymeric substrate, a **polymeric biocompatible material** may be applied via further radio frequency plasma treatment, i.e. a **plasma polymerized deposit**. Note that taught RF plasma powers include about 100-200 W or 50-200 W (claim 16 or col. 6, lines 60-65).

Kamel et al. while employing an initial nitrogen or Ar gas plasma on polymeric substrates, such as PMMA, in teaching a pretreatment activation of the surface that improves adhesion of subsequent

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coatings, do not discuss these plasma treatments as producing further crosslinking of the surfaces, however the energetic environment created by these *in-situ* plasmas would have inherently produced crosslinking in surfaces such as the exemplified PMMA or alternatively taught activation to create active sites would have been reasonably expected to have been provided by optimization inclusive of such bonding rearrangements. Alternatively, Schultz Yamasaki et al., discussed above demonstrated that direct plasmas, inclusive of nitrogen plasmas & Ar plasmas, as well as He plasmas, when used to treat PMMA substrates cause crosslinking thereof, which provides improved adhesion for subsequent plasma deposited coatings, thus it would've been obvious to one of ordinary skill in the art to optimization of the plasma pretreatments of Kamel et al. (including use of suggested plasma apparatus structures/techniques) to effect such crosslinking of polymeric optical lens surfaces, as treated by both references, in order to provide the advantages of improved adhesion of subsequent plasma deposited coatings desired by both references, with the advantage of good optical quality also desired in both references.

15. **Claims 1-8, 13-14 & 17-23** are rejected under 35 U.S.C. **102(b)** as anticipated by or, in the alternative, under 35 U.S.C. **103(a)** as obvious over **Peyman et al.** (4,312,575).

At it at it at **Claims 9-10 & 15-16** are rejected under 35 U.S.C. **103(a)** as being obvious over **Peyman et al.** (4,312,575).

As previously set forth, **Peyman et al.** (abstract; figures; col. 1, lines 7-15; summary, esp. col. 4, lines 28-47 & col. 5, lines 3-11; col. 5, lines 41-col. 6, lines 57+; col. 7, lines 20-32 & 43-66 & Exs. I & II) teach a **coating process** for soft corneal contact lenses, which are oxygen permeable & can be formed of silicone polymers, copolymers of silicon, polyurethane or other oxygen permeable polymeric material suitable for contact lenses, with specific mention of use of copolymers or inter polymers preferred. The core of the polymeric lens is hydrophobic & is coated to **make it hydrophilic**, such that it is highly oxygen permeable & has a **long-lasting wettability** (i.e. stable) via a process using **glow discharge plasma polymerization** of at least one compound inclusive of **hydrocarbons** &/or

halogenated hydrocarbons (including fluorine), where the plasma polymerization is performed to create a highly cross-linked coating, with the examiner noting for it to be highly cross-linked when deposited on the polymeric core, the crossed linking must inherently encompass at least some crosslinking to the polymeric core surface, as suggested lends substrate materials are inclusive of polymers having heteroatoms that would reasonably have been expected to cause/enable crosslinking in a plasma taught to deposit a highly cross-linked coating. A further **glow discharge treatment may be performed in an atmosphere of oxygen or oxygen + Ar to provide a highly hydrophilic surface to the resulting lens**. This second plasma deposition process reads on both the possible options for applicants step (ii), plus employing an oxidizing plasma.

Also, *Exemplary deposition* processes include a 2 step plasma polymerization deposition, where the two main sides of the lens are coated first, then a subsequent deposition process may be performed on the edges of the contact lens core (Ex. I), where it may be considered that after the first deposition the substrate comprises cross-linked material, where coating of the second deposition is all on a part of the structure not previously deposited on, but would reasonably have been expected to be adjacent to & contacting the edges of the previous deposited layer & in its cross-linked material, thus this procedure continues to read on possible meanings of applicants very broadly phrased claims, where some material of the composite substrate has been cross-linked by a previous step & is contacted by the success of plasma at least at some location. Also note that plasmas will inherently cause some degree of heating.

The glow discharge processes employed by Peyman et al.'s examples used 10 kHz power source to create the glow discharge, thus reads on an RF plasma, and while no particular values for power usage, i.e. Watts, were taught, it is specifically taught that the wattage used will depend on such factors as surface area of the electrode, and flow rate and pressure of the monomer utilized (col. 7, lines 59-64), hence it would've been obvious to one of ordinary skill in the art to consider such conditions & employ routine experimentation when performing their various plasma processes, such that it would have been

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reasonably expected by one of ordinary skill in the art to employ powers within ranges claimed, as analogous processing for analogous results are being performed. It is further noted that since the plasma polymerization & postdeposition treatments taught will use specific parameters to achieve specific results, as well as teachings concerning locations treated, the gaps with respect to the surface are inherently limited by parameters employed.

With respect to "superabsorbent", as this term has no clear defined range or specific meaning, it is considered that the created surface having a highly hydrophobic nature which provides long-lasting wettability, may be considered to read on this in definite term. With respect to the capability of "retaining large quantities of a being containing aqueous solutions", bodily fluids to which contact lenses are exposed can contain amines (although they need not ever be so exposed) & since the lenses are hydrophilic & wettable, they may retain aqueous solutions, including such solutions which also contain amines, although whether or not they ever actually do so is not relevant to the present claims.

Note with respect to the glow discharge oxygen treatment, it is noted that such an oxidation method will inherently form among the species of the oxygen containing plasma some ozone, thus may be considered to read on the claimed ozonolysis.

With respect to the claim of a bulk matrix being polyolefin, while Peyman et al. do not specifically teach the copolymers to be employed with the silicone polymer materials, they do not limit what polymeric materials may be employed as copolymers, hence it would've been obvious to one of ordinary skill in the art to use polymeric material known to be desirable in lenses for various known properties desirable therefore, such as those listed in the background in columns 1-3, which encompass polymeric materials employing olefinic components, thus it would've been obvious to one of ordinary skill in the art to use such olefinic components as the generic copolymeric material suggested to be useful in the core substrates. As a substrate material is taught to be oxygen permeable, it is considered to be porous in the scope as defined by applicants' enormously broad & uncertain scope range of void volumes

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that describe porous for purposes of the present specification, and while no particular void volumes are specified by the specification, it would've been obvious to one of ordinary skill in the art that the lower and of the claimed range of void volumes would have reasonably been expected to overlap with such highly oxygen permeable polymeric lenses, in order for them to fulfill their taught capabilities.

16. **Claims 1, 3, 8, 13-16 & 17-23** are rejected under 35 U.S.C. **102(b)** as anticipated by **Sano et al.** (4,265,959).

Claims 9-10 & 16 are rejected under 35 U.S.C. **103(a)** as being obvious over **Sano et al.** (4,265,959).

As previously set forth, **Sano et al.** (abstract; col. 2, lines 1-39 col. 3, lines 7-50; examples) teach a **porous membrane**, on which various operation may be initially performed, inclusive of performing **gelation** (i.e. crosslinking) due to temperature (i.e. heat) to a **cast substrate**, where that porous membrane may be **subsequently plasma treated** the glow discharge employing gases, such as **hydrogen, He, Ar, nitrogen, oxygen,... ammonia, water**. (Reads on claim 1 or 13, steps (i) & (ii)). The porous membrane material is taught to be an acrylonitrile polymer, which may contain polyolefinic components, and where it is taught porosity, while not specifically disclosed, is considered that it must in order to be called porous be somewhere within the broad claimed range. Alternatively, it would've been obvious to one of ordinary skill in the art to employ a void volume in forming the taught porous membrane within typical ranges of what is considered porous, which would have been reasonably expected by one of ordinary skill in the art to be totally encompassed by applicants' range. Note that the exemplary plasma processes disclose a discharge voltage & a discharge current, implying use of DC plasma. While specific plasma powers are not employed it would've been obvious to one of ordinary skill the art to employ routine experimentation, depended on particular plasma apparatus & plasma gasses & relevant plasma parameters with respect thereto, reasonably expected to be inclusive of claimed powers, with it additionally noted that particular power employed is not particularly relevant, as is the power density that makes a difference

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according to what is employed, since the same power may be applied to different volumes & areas to get extremely different effects. Sano et al. also discuss testing the results of their process examples for stability.

17. Applicant's arguments filed 2/18/2010 & discussed above have been fully considered but they are not persuasive.

Applicants habit their arguments of stating that limitations that are not required are present in the claims, makes their arguments extremely unconvincing at best.

18. **Any inquiry** concerning this communication or earlier communications from the examiner should be directed to **Marianne L. Padgett** whose telephone number is **(571) 272-1425**. The examiner can normally be reached on M-F from about 9:00 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks, can be reached at (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Marianne L. Padgett/
Primary Examiner, Art Unit 1792

MLP/dictation software

3/23-24/2010